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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/666,855 | 09/19/2003 | Hiroshi Wada | 9319S-000552 | 5774 |

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| EXAMINER |
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MOON, SEOKYUN

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| ART UNIT | PAPER NUMBER |
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2675

DATE MAILED: 02/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/666,855 | Applicant(s) WADA ET AL. | |
| | Examiner Seokyun Moon | Art Unit 2675 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>9/19, 10/25, 01/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Inventorship

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 1, 2, 3, 7, 8, 9, and 11** are rejected under 35 U.S.C. 102(e) as being anticipated by Saito et al. (U.S. Pat. No. 6,300,997 B1, herein after referred to as "Saito").

As to **claim 1**, Saito teaches a liquid crystal device [*fig. 1*] having liquid crystals between a first substrate ("*segment substrate 32*") and a second substrate ("*common substrate 33*") that faces the first substrate through a sealing material ("*frame-shaped sealing member 34*") [*col. 3 lines 18-19 and lines 24-33*], in which voltages are applied to the first electrodes ("*segment electrodes 38*") on the first substrate and the second electrodes ("*common electrode 40*") on the second substrate, the liquid crystal device comprising:

wiring lines [*fig. 2A*] ("*leading wires 39*"), provided on the second substrate, which are connected to the first electrodes ("*segment electrodes 38*") on the first substrate and each have a part (the upper portion of "*leading wires 39*" with respect to the intersection of "*leading wires 39*" and "*frame-shaped sealing member 34*" arranged in horizontal direction) extending in an area surrounded by inside edges of the sealing material [*col. 3 lines 51-55*]; and

a drive circuit ("*IC module 51*") applying a voltage to the first electrodes through the wiring lines.

Saito does not disclose expressly pixels arranged at the intersections of a plurality of the first electrodes and a plurality of the second electrodes being turned on or off in accordance with voltage applied to the electrodes.

However, it is inherent to include a plurality of pixels comprising switching devices in a liquid crystal device to control the voltages applied to liquid crystals by manipulating ON or OFF state of the switching devices included in pixels.

Saito does not disclose expressly that the effective value of a voltage applied to the liquid crystals at cross sections between one of the wiring lines and first electrodes other than the first electrode connected to the corresponding wiring line among the plurality of first electrodes becomes smaller than the effective value of a voltage applied to the corresponding pixel for turning on the pixel.

However, it is inherent to define or limit the effective value of a voltage applied to the liquid crystals at cross sections being smaller than the effective value of a voltage applied to the corresponding pixel for turning on the pixel in a liquid crystal display apparatus since the effective value of a voltage applied to the pixel for turning on the pixel is the voltage controlling the alignment of the liquid crystals constituting the display operation of the liquid crystal display and the alignment state/mode of liquid crystals at cross sections is determined depending on whether the effective value of the voltage applied to the pixel is greater or less than a certain threshold voltage. When the effective value of the voltage applied to the liquid crystals at cross sections is greater than the effective value of the voltage applied to the pixel for turning on the pixel, the effective value of the voltage applied to the pixel is compensated by the effective value of the voltage applied to the liquid crystals at cross sections and thus overall effective value of the voltage applied to pixel is changed, which causes an unexpected display operation of the display device.

Therefore, it is inherent to limit the effective value of a voltage applied to the liquid crystals at cross sections being smaller than the effective value of a voltage applied to the corresponding pixel for turning on the pixel to maintain the normal operation of the display device.

As to **claim 2**, Saito does not disclose expressly that the effective value of the voltage applied to the liquid crystals at the cross sections becomes smaller than the effective value of a voltage applied to the corresponding pixel for turning off the pixel.

However, it is inherent to define or limit the effective value of a voltage applied to the liquid crystals at cross sections being smaller than the effective value of a voltage applied to the corresponding pixel for turning off the pixel in a liquid crystal display apparatus since the effective value of a voltage applied to the pixel for turning off the pixel is the voltage controlling the alignment of the liquid crystals constituting the display operation of the liquid crystal display and the alignment state/mode of liquid crystals at cross sections is determined depending on whether the effective value of the voltage applied to the pixel is greater or less than a certain threshold voltage. When the effective value of the voltage applied to the liquid crystals at cross sections is greater than the effective value of the voltage applied to the pixel for turning off the pixel, the effective value of the voltage applied to the pixel is compensated by the effective value of the voltage applied to the liquid crystals at cross sections and thus overall effective value of the voltage applied to pixel is changed, which causes an unexpected display operation of the display device.

Therefore, it is inherent to limit the effective value of a voltage applied to the liquid crystals at cross sections being smaller than the effective value of a voltage applied to the corresponding pixel for turning off the pixel.

Saito does not teach at least one of a duty ratio and a bias ratio being determined such that the effective value of the voltage applied to the liquid crystals at the cross sections becomes smaller than the effective value of a voltage applied to the corresponding pixel for turning off the pixel.

However, it is known that both of a duty ratio and a bias ratio are the factors causing changes on both of the effective value of the voltage applied to the liquid crystals at the cross sections and the effective value of the voltage applied to the pixel since the duty ratio is proportional to the length of the selection period for common electrodes and the bias ratio is proportional to the absolute value of a peak value of a scanning signal applied to the common electrode.

Therefore, it is inherent to set at least one of a duty ratio and a bias ratio such that the effective value of the voltage applied to the liquid crystals at the cross sections becomes smaller than the effective value of a voltage applied to the corresponding pixel for turning off the pixel.

As to **claim 3**, all of the claim limitations have already been discussed with respect to the rejection of claim 2.

As to **claim 7**, all of the claim limitations have already been discussed with respect to the rejection of claim 1.

As to **claim 8**, all of the claim limitations have already been discussed with respect to the rejection of claim 2.

As to **claim 9**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 11**, all of the claim limitations have already been discussed with respect to the rejection of claim 1.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito in view of Kawakami et al. ("*Matrix Addressing Technology of Twisted Nematic Liquid Crystal Display*", Hitachi Research Laboratory, Hitachi, Ltd., herein after referred to as "Kawakami").

Saito does not teach the effective value of the voltage applied to the liquid crystals at the cross sections is smaller than an intermediate value between the effective value of the voltage applied to the corresponding pixel for turning on the pixel and the effective value of a voltage applied to the corresponding pixel for turning off the pixel.

However, Kawakami discloses that the RMS value of the threshold voltage for TNLC cells is an intermediate voltage value between the RMS voltage across selected pixels and the RMS voltage across non-selected pixels [*pg. 51 fig. 5 and pg. 52 the paragraph written under fig. 6*].

Since the threshold voltage is the minimum voltage to turn on a pixel, the effective value of the voltage applied to the pixel must be greater than the threshold voltage to turn on the pixel. However, if the effective value of the voltage applied to the liquid crystals at the cross sections is greater than the threshold voltage, the effective value of the voltage applied to the pixel is compensated with the effective value of the voltage applied to the liquid crystals at the cross sections and thus reduced to a value less than the threshold voltage causing the pixel to be off even though the pixel is supposed to be on.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to teach Saito to set the effective value of the voltage applied to the liquid crystals at the cross sections is smaller than an intermediate value between the effective value of the voltage applied to the corresponding pixel for turning on the pixel and the effective value of a voltage applied to the corresponding pixel for turning off the pixel to provide a wide compatible range for the effective value of the voltage applied to the liquid crystals at cross sections, thus to reduce the limitations of variables such as applicable voltage and current range for the electronic circuits implemented in a display device.

7. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito in view of Morimoto et al. (U.S. Pat. No. 6,181,406 B1, herein after referred to as "Morimoto").

Saito does not teach a light-shielding layer provided on one of the first substrate and the second substrate.

However, Morimoto [*fig. 4*] teaches a light-shielding layer ("*light-shielding layer 63 and 64*") provided on one of the first substrate ("*opposite substrate 22*") and the second substrate ("*array substrate 20*") so as to overlay the cross sections between one of the wiring lines and first electrodes other than the first electrode connected to the corresponding wiring line among the plurality of first electrodes [*col. 8 lines 43-49*].

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a light-shielding layer in a liquid crystal display device as taught by Morimoto, in Saito to shield light and thus to optimize the display output contrast of the display device by blocking any interfering light.

8. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito.

Saito does not disclose expressly the liquid crystal device being implemented in an electronic equipment.

However, examiner takes official notice that implementing a liquid crystal display device in an electronic equipment such as computer, mobile phone, PDA, and etc. is common and well known.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Saito's display device in an electronic equipment requiring a display unit.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tomita et al. (JP Pat. No. 407270811 A) discloses a liquid crystal display element capable of preventing the generation of an abnormal lighting and an abnormal display in a state in which the width of the coating area of sealing material is made to be an absolute minimum.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seokyun Moon whose telephone number is (571) 272-5552. The examiner can normally be reached on Mon - Fri (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2675

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

2006/02/02
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Amare Mengistu
Primary Examiner